$$\lim_{x\to\infty} \frac{3x+5}{6x-2}$$

$$\lim_{x\to-\infty} = \frac{1}{2}$$

$$\frac{3x}{6x} = \frac{1}{2}$$

$$\lim_{x\to\infty} \frac{3x+5}{6x-2}$$

$$= \lim_{x\to\infty} \frac{x\left(3+\frac{5}{x}\right)}{x\left(6-\frac{2}{x}\right)}$$

$$= \lim_{x\to\infty} \frac{3+\frac{5}{x}}{6-\frac{2}{x}} = \frac{3+0}{6-0} = \frac{3}{6} = \frac{1}{2}$$

"$\frac{\infty}{\infty}$" ish

just like $\frac{0}{0}$, $\frac{\infty}{\infty}$ = IDK

$$\lim_{x\to-\infty} \frac{4x^2-x}{2x^3-5} \overset{\text{"}-\text{"}}{=} \lim_{x\to-\infty} \frac{x^2\left(4-\frac{1}{x}\right)}{x^3\left(2-\frac{5}{x^3}\right)}$$

$$= \lim_{x\to-\infty} \frac{4-\frac{1}{x}}{x\left(2-\frac{5}{x^3}\right)}$$

$$\lim_{x\to-\infty} \frac{4}{x(2)}$$

$$= \frac{4+0}{\infty\left(2-0\right)} = 0$$

$$= \lim_{x\to-\infty} \frac{2}{x}$$

$$\lim_{x \to -\infty} \frac{4x^2 - x}{2x^3 - 5} = \lim_{x \to -\infty} \frac{x(4x-1)}{x\left(2x^2 - \frac{5}{x}\right)}$$

$$= \lim_{x \to -\infty} \frac{4x-1}{2x^2 - \frac{5}{x}} = \lim_{x \to -\infty} \frac{x\left(4 - \frac{1}{x}\right)}{x\left(2x - \frac{5}{x^2}\right)}$$

$$\frac{4x^2}{2x^3} = \frac{2}{x}$$

$$= \lim_{x \to -\infty} \frac{4 - \frac{1}{x} \to 4}{2x - \frac{5}{x^2} \to -\infty}$$

$$= 0$$

$$\lim_{x\to\infty}\sqrt{\frac{3x+5}{6x-8}}$$

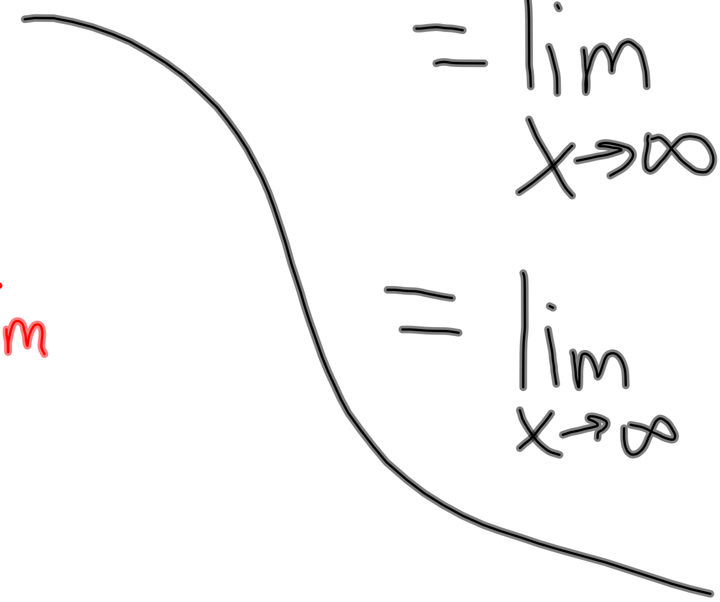
$$=\sqrt{\lim_{x\to\infty}\frac{3x+5}{6x-8}}=\sqrt{\frac{1}{2}}$$

$$=\frac{\sqrt{1}}{\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}}$$

$$=\frac{\sqrt{2}}{2}$$

$$\lim_{x\to\infty} \frac{\sqrt{x^2+2}}{3x-6} = \lim_{x\to\infty} \frac{\sqrt{x^2}\sqrt{1+\frac{2}{x^2}}}{x\left(3-\frac{6}{x}\right)}$$

$$= \lim_{x\to\infty} \frac{x\sqrt{1+\frac{2}{x^2}}}{x\left(3-\frac{6}{x}\right)}$$



lim

$$= \lim_{x\to\infty} \frac{\sqrt{1+\frac{2}{x^2}}}{3-\frac{6}{x}} = \frac{\sqrt{1}}{3}$$

$$= \frac{1}{3}$$

$$\lim_{x\to-\infty} \frac{\sqrt{x^2+2}}{3x-6} = \lim_{x\to-\infty} \frac{\sqrt{x^2}\sqrt{1+\frac{2}{x^2}}}{x\left(3-\frac{6}{x}\right)}$$

$$= \lim_{x\to-\infty} \frac{|x|\sqrt{1+\frac{2}{x^2}}}{x\left(3-\frac{6}{x}\right)}$$

$$= \lim_{x\to-\infty} \frac{(-x)\sqrt{1+\frac{2}{x^2}}}{x\left(3-\frac{6}{x}\right)}$$

$$= \lim_{x\to-\infty} \frac{-\sqrt{1+\frac{2}{x^2}}}{3-\frac{6}{x}}$$

$$= -\frac{1}{3}$$

$$\lim_{x\to\infty} \frac{\sqrt{x^6+5}-x^3}{1}$$

$$\| (a+b)^2 \neq a^2+b^2$$

$$= \lim_{x\to\infty} \frac{(\sqrt{x^6+5}-x^3)(\sqrt{x^6+5}+x^3)}{\sqrt{x^6+5}+x^3}$$

$$= \lim_{x\to\infty} \frac{x^6+5-x^6}{\sqrt{x^6+5}+x^3}$$

$$= \lim_{x\to\infty} \frac{5}{\sqrt{x^6+5}+x^3} = 0$$

$$\lim_{x\to\infty}\frac{3x+5}{6x-8}=\frac{1}{2}$$

$$\frac{3x}{6x}=\frac{1}{2}$$

$$\lim_{x\to\infty}\frac{3x+5}{6x-8}$$

Like "$\frac{\infty}{\infty}$" -ish

sim. to $\frac{0}{0}$

YDKA

$$=\lim_{x\to\infty}\frac{\cancel{x}\left(3+\frac{5}{x}\right)}{\cancel{x}\left(6-\frac{8}{x}\right)}$$

$$=\lim_{x\to\infty}\frac{3+\frac{5}{x}}{6-\frac{8}{x}}=\frac{3+0}{6-0}=\frac{1}{2}$$

"to cancel out infinities"

$$\lim_{x \to -\infty} \frac{4x^2 - x}{2x^3 - 5} \qquad \frac{4x^2}{2x^3} \to \frac{2}{x}$$

$$\lim_{x \to -\infty} \frac{x(4x-1)}{x\left(2x^2 - \frac{5}{x}\right)} = \lim_{x \to -\infty} \frac{4x-1}{2x^2 - \frac{5}{x}}$$

$$= \lim_{x \to -\infty} \frac{x\left(4 - \frac{1}{x}\right)}{x\left(2x - \frac{5}{x^2}\right)} = \lim_{x \to -\infty} \frac{4 - \frac{1}{x} \to 4}{2x - \frac{5}{x^2} \to -\infty} \cdots = 0$$

$$\lim_{x \to -\infty} \frac{4x^2 - x}{2x^3 - 5} = \lim_{x \to -\infty} \frac{x^3\left(\frac{4}{x} - \frac{1}{x^2}\right)}{x^3\left(2 - \frac{5}{x^3}\right)}$$

$$= \lim_{x \to -\infty} \frac{\frac{4}{x} - \frac{1}{x^2}}{2 - \frac{5}{x^3}} = \frac{0-0}{2-0} = \frac{0}{2} = 0$$

$$\lim_{x\to-\infty} \frac{x^2\left(4-\frac{1}{x}\right)}{x^3\left(2-\frac{5}{x^3}\right)}$$

$$=\lim_{x\to-\infty} \frac{4-\frac{1}{x}}{x\left(2-\frac{5}{x^3}\right)}$$

$$=\lim_{x\to-\infty} \left(\frac{1}{x}\right)\left(\frac{4-\frac{1}{x}}{2-\frac{5}{x^3}}\right)$$

$$0\left(\frac{4-0}{2}\right)$$

$$\lim_{x\to\infty}\sqrt{\frac{3x+5}{6x-8}} = \sqrt{\lim_{x\to\infty}\frac{3x+5}{6x-8}}$$

$$= \sqrt{\frac{1}{2}} = \frac{\sqrt{2}}{2}$$

$$\frac{\sqrt{1}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$\lim_{x \to +\infty} \frac{\sqrt{x^2+2}}{3x-6}$$

$$\sqrt{a+b} \neq \sqrt{a} + \sqrt{b}$$

$$\sqrt{1+1} \stackrel{?}{=} 1+1=2$$

:(

because $x+$

$$\lim_{x \to +\infty} \frac{\sqrt{x^2} \cdot \sqrt{1+\frac{2}{x^2}}}{x\left(3-\frac{6}{x}\right)} = \lim_{x \to +\infty} \frac{x\sqrt{1+\frac{2}{x^2}}}{x\left(3-\frac{6}{x}\right)}$$

$$= \lim_{x \to +\infty} \frac{\sqrt{1+\frac{2}{x^2}}}{3-\frac{6}{x}} = \frac{\sqrt{1}}{3}$$

$$\lim_{x \to -\infty} \frac{\sqrt{x^2+2}}{3x-6}$$

$$\lim_{x \to -\infty} \frac{\sqrt{x^2}\sqrt{1+\frac{2}{x^2}}}{x\left(3-\frac{6}{x}\right)}$$

LKF

$$|x| = \begin{cases} x, & x \geq 0 \\ -x, & x < 0 \end{cases}$$

$$= \lim_{x \to -\infty} \frac{|x|\sqrt{1+\frac{2}{x^2}}}{x\left(3-\frac{6}{x}\right)} = \lim_{x \to -\infty} \frac{(-x)\sqrt{1+\frac{2}{x^2}}}{x\left(3-\frac{6}{x}\right)}$$

$$= \lim_{x \to -\infty} \frac{-\sqrt{1+\frac{2}{x^2}}}{3-\frac{6}{x}} = -\frac{1}{3}$$

$$\lim_{x \to \infty} \sqrt{x^6+5} - x^3$$

$$\lim_{x \to \infty} \frac{\left(\sqrt{x^6+5} - x^3\right)\left(\sqrt{x^6+5} + x^3\right)}{\sqrt{x^6+5} + x^3}$$

$$= \lim_{x \to \infty} \frac{(x^6+5) - x^6}{\sqrt{x^6+5} + x^3} = \lim \frac{5}{2\cdot}$$

$$= 0$$